PERMIT NUMBER:	000089	**App. ID(s):**	405046
BUSINESS NAME:	Microchip	**Revision(s):**	3.0.0.0
SOURCE TYPE:	Semiconductor Manufacturer	**Revision Type(s):**	Renewal
PERMIT ENGINEER:	Ralph A Munoz	**Date Prepared:**	12/18/2014

BACT: Yes	**MACT:** Yes	**NSPS:** Yes	**SYNTH MINOR:** Yes	**AIRS:** No
DUST PLAN REQUIRED: No		**DUST PLAN RECEIVED:** No		
O&M PLAN REQUIRED: Yes		**O&M PLAN RECEIVED:** Yes		
PORTABLE SOURCE: No		**SITE VISIT: Waived**		**Todd 08/14/15**

PROCESS DESCRIPTION:
Semiconductor fabrication where Integrated circuit (ICs) are produced on the wafers. Semiconductor wafers are most commonly made of silicon. Different substrates require the use of different processing materials for etching, doping and layer operations, which result in different hazardous air pollutant(HAP) emissions

Manufacturing Process Description

Semiconductors are materials with an electrical conductivity between that of a conductor and an insulator. The manufacturing occurs in a clean environment and process steps involve cleaning with acids or solvents as well as the use of numerous other process chemicals. Semiconductors are fabricated in batches of silicon wafers. The basic fabrication processes are oxidation, photolithography, etching, doping, and layering. During the fabrication process, wafers are cycled through several steps with some steps repeated for various purposes at different points in the process.

Oxidation

Oxidation involves the generation of a silicon dioxide layer on the wafer surface to provide a base for the photolithography process. This layer also insulates and protects the wafer during subsequent processing. In the furnace, the silicon wafer surface oxidizes with steam or a gas such as oxygen to form additional semiconductor material. These processes also use chlorine containing materials such as dichlorosilane which break down during processing and form byproduct emissions of HCl and Cl_2.

Photolithography

Photolithography is the process of imaging a circuit pattern onto a wafer. Photoresist material is spun onto the wafer to create an even layer of coating and then heat treated to remove any solvent remaining in the resist material. A photomask is placed over the wafer and light is projected through the voids in the photomask to form electrical patterns. After exposure, the wafer is developed in a solution that dissolves the excess photoresist and is then rinsed to remove excess developer solution. The resulting wafer has a silicon dioxide layer exposed for the circuit pattern, with the rest of the wafer being covered with the remaining resist coating. Both the photoresist itself and the material used to remove excess photoresist from the edge of the wafer are organic and generate some VOC emissions during the process.

Etching

Etching chemically removes unwanted materials from layers of the wafer. Wet chemical etching uses acid solutions to etch the exposed layer of silicon dioxide at ambient or elevated temperatures. These acid solutions are a source of HAP emissions. In dry etching, etches are formed above the target layer by ionizing process gases under a vacuum. After etching, the remaining photoresist is removed using dry or liquid stripping compounds. Dry etchants are typically chlorinated or fluorinated gases (e.g. Cl_2, SF_6) which will dissociate in the plasma and

form byproduct emissions.

Deposition

Deposition processes apply additional layers of silicon, silicon dioxide, or other materials to the wafer. Gases are used to periodically clean the reaction chamber for those deposition processes.

Cleaning

Various organic and inorganic cleaners are used to clean equipment parts and quartz reaction chambers. Organic cleaners can include isopropanol and ethyl lactate among others and are a source of VOC emissions. Inorganic cleaners include acids such as HF, and bases such as ammonium hydroxide. Cleaning operations are sources of both VOC and HAP emissions.

Support Equipment

Boilers

The boilers supply steam or hot water to the fab. The boilers operate solely on natural gas.

Emergency Generators/Fire Pumps

Emergency generators back up all critical systems at the site. The generators combust ultra-low sulfur diesel fuel (#2 fuel oil).

Cooling Towers

The facility has mechanically non-process cooling towers that are open to the atmosphere. The cooling towers are used to dissipate the large heat loads generated by the factory and to condition the incoming air to the correct temperature required by the factory. The heat is removed by air handlers whose heat is ultimately rejected to the atmosphere from the cooling towers.

PERMIT HISTORY:

Date Received	Revision Number	Description
04/14/2000	0.0.0.0	Submitted application for new permit
08/20/2001	0.0.0.1	Seven-day notification
08/07/2002	0.0.1.0	Submitted minor modification
11/30/2004	0.0.2.0	Submitted minor modification to switch out sinks for new ones and adjust material usage accordingly
04/20/2005	0.0.3.0	Submitted minor modification to add, remove and adjust chemicals within the list of emissions.
06/28/2005	0.0.4.0	Submitted minor modification
06/15/2005	1.0.0.0	Submitted application for renewal permit
08/27/2007	1.0.1.0	Submitted minor modification to install a new scrubber
01/22/2008	1.0.1.1	Administrative change
05/06/2008	1.0.1.2	Administrative change
07/24/2008	1.0.2.0	Submitted minor modification to revise permit language in one condition.
09/09/2008	1.0.2.1	Administrative change
09/26/2008	1.0.3.0	Submitted minor modification to add, remove and adjust chemicals within the list of emissions.

10/22/2008	1.0.3.1	Administrative change
12/17/2008	1.0.4.0	Submitted minor modification to add chemicals within the list of emissions.
04/16/2009	1.0.5.0	Submitted minor modification to add two chemicals, emitted from the use of photoresist, to the list of emissions.
04/28/2009	1.0.5.1	Administrative change
05/27/2010	1.0.6.0	Submitted minor modification to adjust the RTO bypass language and increase the CO, NOx and SOx limitations
06/14/2010	1.0.7.0	Submitted minor modification to add an RCTO to the permit
06/22/2010	1.0.8.0	Submitted minor modification to add language for testing of the RTO for emissions estimation purposes
05/27/2010	2.0.0.0	Submitted application for renewal permit
01/19/2011	2.0.0.1	Administrative change
01/31/2011	2.0.0.2	Administrative change
12/01/2011	2.1.0.0	Non-Minor Permit Revision submitted to accept and incorporated a Greenhouse Gas synthetic minor Emission limit.
10/16/2014	2.1.1.0	Minor Modification submitted to remove permit language regarding GHG emissions. Removed the listing of semiconductor manufacturing equipment from equipment list since the listing is not required.
05/11/2015	3.0.0.0	Renewal Permit Application – No changes requested

PURPOSE FOR APPLICATION:
Application was submitted for renewal of permit.

A. APPLICABLE COUNTY REGULATIONS:

Rule 100: General Provisions and Definitions
Rule 200: Permit Requirements
Rule 220: Non-Title V Permit Provisions
Rule 270: Performance Tests
Rule 280: Fees: Table H: Semiconductor Manufacturing Greater than or Equal to 25 tons/year VOC
Rule 323: Fuel Burning Equipment from Industrial/Commercial/Institutional (ICI) Sources
Rule 324: Stationary Internal Combustion (IC) Engines
Rule 331: Solvent Cleaning
Rule 338: Semiconductor Manufacturing

Rule 241: Permits for New Sources and Modifications to Existing Sources - Previously triggered BACT for VOC, and accepted a limit to avoid triggering BACT for NOx.

B. APPLICABLE FEDERAL REGULATIONS:

40 CFR 63 Subpart ZZZZ - Microchip has Reciprocating Internal Combustion Engines on site that were manufactured before June 12th, 2006. These engines are used for emergency purposes only and Microchip is not considered Residential, Commercial, or Institutional. The requirements of MACT ZZZZ will be put in to the permit for these engines.

40 CFR 60 Subpart Dc – This facility has four (4) boilers with rated capacity of greater than 10 MMBtu/hr. None of them are rated above 100 MMBtu/hr, which would trigger 40 CFR Subpart Db instead of 40 CFR Subpart Dc.

NON-APPLICABLE FEDERAL REGULATIONS:

40 CFR 63 Subpart BBBBB – Does not apply since Microchip is not a major source.

40 CFR 63 Subpart WWWWWW – No plating and polishing operations at Microchip contain any cadmium, chromium, nickel, lead, or manganese.

40 CFR 60 Subpart IIII –Microchip has no engines that were manufactured after April 1st, 2006.

C. AIR POLLUTION CONTROL EQUIPMENT/EMISSION CONTROL SYSTEM(s):

System description	Quantity	Comments:
Scrubbers	9	Manufacturing emissions .
RTO #20-1	1	Back up VOC abatement unit.
RCTO #20-2	1	VOC abatement unit for fab operations.

D. EMISSIONS:

Semiconductor Manufacturing Operations:

Microchip Tempe Permit Process Emission Factors and Abatement Removal Efficiency:

The following processes used estimated emission factors using process experience and available emission estimating techniques.

-Chemical Vapor Deposition Processes
-Diffusion Processes
-Atmospheric Chemical Vapor Deposition
-Ion Implant Processes
-Etch Processes
-Wet Bench Processes
-Non-Atmospheric Chemical Vapor Deposition Processes
-Wafer Cleaning Processes
-Acid solutions, Alkaline Solutions and Additional Organic Compounds

In general, the Permittee uses emission factors to calculate emissions. The emission factors are based on the chemical constituent used in the equipment, and upon the type of equipment itself.

$$\textit{Semiconductor Process Emissions} = \sum_x U_x \sum_y P_y F_y \left(1 - A_y\right)$$

U_x = Amount of product 'x' used (lbs)
P_y = Weight percentage of each species 'y' in product 'x' (%)
F_y = Emission factor for species 'y' as identified in the permit application (lbs/lb) – These emission factors are found in the document titled "Microchip Tempe Permit Process Emission Factors and Abatement Removal Efficiencies" provided by Trinity Consultants for Microchip.
A_y = Emission control system removal efficiency for each exhaust stream routed to the emissions control device (%)

Note: For semiconductor processes in which HAPs are formed as a byproduct, the units of Fy will be (lbs species z/lb species y)

It is assumed that the VOC abatement unit(s) achieves 80% capture and abatement of VOCs which are exhausted to the device.

The centralized wet scrubbers are assumed to achieve the following removal efficiencies:
Arsine: 0%
Chlorine: 50%

Hydrochloric acid: 60%
Hydrofluoric acid: 60%
Nitric Acid: 40%
Phosphine: 0%

The removal efficiencies are below the 90% usually expected from a wet scrubber due to the fact that the inlet concentrations are small.

Boilers, VOC Abatement Units and POU Abatement Devices

Air pollution emissions for the natural gas boilers and POU abatement devices were calculated using the US EPA's published emission factors (as found in EPA AP-42 Table 1.4-1 and 1.4-2). Natural gas-fired boilers emissions were calculated as shown below.

$E_i = UF_i$

Where:

E_i = Emission of Species i, lb/yr

U = Usage of Fuel, MMscf/yr (MMscf = million standard cubic feet)

F_i = Emission Factor for Species i, lb/MMscf

For example,
CO Emissions burning 100 MMscf of natural gas per year:

E_{CO} = 100 MMscf/yr * 84 lb/mmscf
E_{CO} = 8,400 lb/yr = 4.2 tons/year

-Microchip has 5 natural gas boilers on site, two boilers rated at 12.55 MMBtu/hr, two boilers at 12.25 MMbtu/hr, and one boiler at 0.399 MMbtu/hr.
-Microchip also has projected the use of 10 POU abatement devices which use natural gas, Each rated at 100,000 Btu/hr. The emission factor for NOx was increased by a factor of 10 to account for higher combustion temperature and additional oxidation of nitrogen-bearing compounds (e.g. nitrous oxide)

RCTO 20-2

-Microchip also uses rotor-concentrator/thermal oxidizer with natural gas. The maximum Btu/hr of the RCTO 20-2 is 2.30 MMBtu/hr.

The PM10, SOx and VOC emissions from oxidizing natural gas in the VOC abatement unit(s) were calculated using AP-42 Tables 1.4-1 and 1.4-2 for boilers.

Microchip has installed a new RCTO (RCTO 20-2) in early 2011 to replace existing RTO (RTO 20-1). The existing RTO could be utilized as a back-up unit. Emission calculations were taken from MCAQD RCTO performance testing on March 31, 2011, with estimated increase CO and NOx emissions due to possible operations of RTO as a back-up and future production operations.
NOx:
Previous RCTO performance test for NOx was 0.059 lbs/hr. This NOx emissions rate will be increased for future production operations and use of RTO as back-up to 0.30 lb/hour of 2,628 lbs/year.
CO:
Previous RCTO performance test for CO was 0.15 lbs./hr. This CO emission rate will be increased for future operations and use of RTO as back-up to 0.60 lbs/hr or 5,256 lbs/year.

Emergency generators

Air pollution emissions from the use of emergency generators is calculated using the US EPA's published emission factors (as found in EPA AP-42 Tables 3.3-1 and 3.4-1). Diesel #2 fired emergency generators emissions are calculated as shown below.

$E_i = RUF_i$

Where:
E_i = Emission of Species i, lb/yr
R = Horsepower Rating of Engine
U = Usage of Engine, hours/year
F_i = Emission Factor for Species i, lb/hp-hr

For example:
CO emission factor from AP-42 Table 3.4-1 emergency diesel fuel generators >600 Hp is 0.0055 lbs/hp-hr

E_{CO} = 1199 HP emergency generator * 200 hr/year * 0.0055 lb of CO/hp-hr
E_{CO} = 1319 lbs of CO/year

Microchip has one diesel fueled emergency generator rated below 600 Hp and three diesel fueled emergency generators above 600 hp.
EPG-1 rated at 519 hp
EPG-2 rated at 1199 hp
EPG-3 rated at 1489 hp
EPG-4 rated at 1489 hp

Emissions were calculated at 200 hours per year each for four diesel generators.
Daily emissions were not calculated since emergency generators are exempt from the daily BACT thresholds of Rule 241.

FACILITY WIDE ALLOWABLE EMISSIONS

	Daily Emission Limits	Twelve Month Rolling Total Emission Limits
Carbon Monoxide (CO)	109 lbs	28,280 lbs/yr
Nitrogen Oxides (NOx) - From process emissions and existing equipment.	150 lbs	49,983 lbs/yr (1)
Nitrogen Oxides (NOx) – Alternate operating scenario	53 lbs	13,801 lbs/yr (2)
Sulfur Oxides (SOx)	6 lbs	876 lbs/yr
Particulate Matter < 10 micron diam. (PM-10)	95 lbs	26,428 lbs/yr
Particulate Matter < 2.5 micron diam. (PM-2.5)	95 lbs	26,428 lbs/yr
Volatile Organic Compounds (VOC)	N/A	80,398 lbs/yr
Total Hazardous Air Pollutants (HAPs)	N/A	14,578 lbs/yr
Any single Hazardous Air Pollutant (HAP)	N/A	9,802 lbs/yr

Daily emissions were calculated assuming 260 days per year of operating days and dividing the annual emissions by this number. These daily limits were established to protect daily BACT Rule 241 limits. These daily emission limits are allowed to be calculated as monthly averages over the number of operating days in that month.

E. HAP EMISSION IMPACTS:

HAP modeling was not conducted with this renewal since HAP emissions have not increased more than de mininus values in lbs/year for any single HAP. Microchip conducted their own AERMOD model at initial permit issuance for all HAPs and is on file with MCAQD; emissions have not changed significantly since that time. See below for the modeling performed:

> *The Permittee performed an ambient air quality impact assessment for the chemicals released for which AAAQGs have been established. The modeled concentrations were determined using the ISCST3 model using the most recent 5 years of pre-processed meteorological data available through the EPA Support Center for Regulatory Air Models. The emission rates modeled are based on the maximum hypothetical emission rates and parameters, which excludes point of use control reduction and considers a once in 5-year maintenance shutdown of the RTO resulting in potential short term emission increases for certain organic compounds that are normally abated through the RTO.*

ISCST3 Emission Concentration Analysis Summary Comparison with Proposed AAAQGs

Chemical	Ave Time	AAAQG (µg/m^3)	Resident (µg/m^3)	% of AAAQG	Off Site Worker (µg/m^3)	% of AAAQG	Maximum Offsite Concentration (µg/m^3)	% of AAAQG
Acetic Acid	Hourly	3.10E+02	5.60E-02	0.02%	2.15E-01	0.07%	2.15E-01	0.07%
	24-Hour	2.00E+02	9.03E-03	0.00%	1.32E-02	0.01%	3.97E-02	0.02%
	Annual	None	6.40E-04	NA	6.71E-04	NA	4.66E-03	NA
Acetone	Hourly	2.00E+04	1.31E+01	0.07%	1.48E+02	0.74%	1.48E+02	0.74%
	24-Hour	1.40E+04	2.22E+00	0.02%	6.24E+00	0.04%	1.87E+01	0.13%
	Annual	None	4.69E-02	NA	4.97E-02	NA	3.45E-01	NA
Ammonia	Hourly	2.30E+02	5.01E+01	21.78%	1.60E+02	69.57%	1.60E+02	69.57%
	24-Hour	1.40E+02	7.28E+00	5.20%	9.85E+00	7.04%	2.96E+01	21.14%
	Annual	None	6.30E-01	NA	5.79E-01	NA	4.02E+00	NA
Arsine	Hourly	6.00E-02	2.04E-03	3.40%	7.82E-03	13.03%	7.82E-03	13.03%
	24-Hour	1.60E-02	3.30E-04	2.06%	4.83E-04	3.02%	1.45E-03	9.06%
	Annual	0.00023	2.00E-05	8.70%	2.45E-05	10.65%	1.70E-04	73.91%
Boron Trichloride	Hourly	None	3.96E-01	NA	9.63E-01	NA	9.63E-01	NA
	24-Hour	3.80E+01	5.22E-02	0.14%	6.97E-02	0.18%	2.09E-01	0.55%
	Annual	None	5.90E-03	NA	2.93E-03	NA	2.04E-02	NA
Boron Trifluoride	Hourly	9.00E+01	1.23E-02	0.01%	4.72E-02	0.05%	4.72E-02	0.05%
	24-Hour	2.40E+01	1.99E-03	0.01%	2.91E-03	0.01%	8.73E-03	0.04%
	Annual	None	1.40E-04	NA	1.48E-04	NA	1.03E-03	NA
Chlorine	Hourly	2.50E+01	1.44E+00	5.76%	3.49E+00	13.96%	3.49E+00	13.96%
	24-Hour	1.20E+01	1.89E-01	1.58%	2.52E-01	2.10%	7.58E-01	6.32%
	Annual	None	2.14E-02	NA	1.06E-02	NA	7.38E-02	NA
Diborane	Hourly	3.00E+00	3.00E-05	0.00%	2.30E-04	0.01%	2.30E-04	0.01%
	24-Hour	7.90E+01	0.00E+00	0.00%	1.33E-05	0.00%	4.00E-05	0.00%
	Annual	None	0.00E+00	NA	0.00E+00	NA	0.00E+00	NA
Dichlorosilane	Hourly	None	2.23E+00	NA	2.46E+01	NA	2.46E+01	NA
	24-Hour	5.30E+00	2.48E-01	4.68%	1.32E+00	24.91%	3.98E+00	75.09%
	Annual	None	1.54E-02	NA	6.16E-02	NA	4.28E-01	NA
Ethanol	Hourly	5.70E+04	4.03E+00	0.01%	4.67E+01	0.08%	4.67E+01	0.08%
	24-Hour	1.50E+04	6.77E-01	0.00%	1.97E+00	0.01%	5.90E+00	0.04%
	Annual	None	1.43E-02	NA	1.28E-02	NA	8.89E-02	NA
Hydrochloric Acid	Hourly	2.10E+02	1.46E+00	0.70%	3.36E+00	1.60%	3.36E+00	1.60%
	24-Hour	5.60E+01	1.96E-01	0.35%	2.50E-01	0.45%	7.50E-01	1.34%
	Annual	7	2.20E-02	0.31%	1.31E-02	0.19%	9.09E-02	1.30%
Hydrofluoric Acid	Hourly	4.20E+01	1.23E+01	29.29%	2.60E+01	61.90%	2.60E+01	61.90%
	24-Hour	2.00E+01	1.58E+00	7.90%	1.87E+00	9.35%	5.60E+00	28.00%
	Annual	None	1.82E-01	NA	1.02E-01	NA	7.06E-01	NA
Isopropanol	Hourly	1.00E+04	2.22E+03	22.20%	3.84E+03	38.40%	3.84E+03	38.40%
	24-Hour	7.80E+03	2.41E+02	3.09%	2.76E+02	3.54%	8.30E+02	10.64%
	Annual	None	1.55E+01	NA	1.41E+01	NA	9.82E+01	NA
n-Butyl Acetate	Hourly	7.90E+03	2.26E+00	0.03%	2.67E+01	0.34%	2.67E+01	0.34%
	24-Hour	5.60E+03	3.77E-01	0.01%	1.12E+00	0.02%	3.37E+00	0.06%
	Annual	None	2.63E-03	NA	6.22E-03	NA	4.32E-02	NA
Nitric Acid	Hourly	8.30E+01	3.38E-01	0.41%	1.29E+00	1.55%	1.29E+00	1.55%
	24-Hour	4.00E+01	5.48E-02	0.14%	7.94E-02	0.20%	2.39E-01	0.60%
	Annual	None	3.86E-03	NA	4.06E-03	NA	2.82E-02	NA
Phosphine	Hourly	1.10E+01	1.27E-01	1.15%	8.62E-01	7.84%	8.62E-01	7.84%
	24-Hour	3.20E+00	1.67E-02	0.52%	5.13E-02	1.60%	1.54E-01	4.81%
	Annual	None	1.15E-03	NA	3.13E-03	NA	2.17E-02	NA
Phosphoric Acid	Hourly	2.50E+01	1.28E-01	0.51%	2.34E-01	0.94%	2.34E-01	0.94%
	24-Hour	7.90E+00	1.62E-02	0.21%	1.79E-02	0.23%	5.38E-02	0.68%
	Annual	None	1.75E-03	NA	1.19E-03	NA	8.28E-03	NA
PGME	Hourly	4.50E+03	2.14E+02	4.76%	2.52E+03	56.00%	2.52E+03	56.00%
	24-Hour	2.90E+03	3.57E+01	1.23%	1.06E+02	3.66%	3.19E+02	11.00%
	Annual	None	2.50E-01	NA	5.92E-01	NA	4.11E+00	NA
Sulfuric Acid	Hourly	2.50E+01	3.03E-01	1.21%	7.37E-01	2.95%	7.37E-01	2.95%
	24-Hour	7.90E+00	4.00E-02	0.51%	5.32E-02	0.67%	1.60E-01	2.03%
	Annual	None	4.53E-03	NA	2.25E-03	NA	1.56E-02	NA
Tetrafluoromethane	Hourly	None	3.48E+01	NA	8.45E+01	NA	8.45E+01	NA
	24-Hour	3.00E+02	4.58E+00	1.53%	6.11E+00	2.04%	1.84E+01	6.13%
	Annual	None	5.18E-01	NA	2.57E-01	NA	1.79E+00	NA

Modeled exposures do not exceed the AAAQGs at any of the receptor locations.

F. PERFORMANCE TESTING:

Centralized wet scrubbers and centralized VOC abatement unit(s) testing methods were added as alternatives to what was already in the previous permit:

VOC for the VOC abatement unit(s):

> VOC testing shall be conducted in accordance with ASTM D6348-12, EPA Test Method 320, 25 or 25A. Testing to quantify exempt compounds, such as methane, shall be conducted in accordance with EPA

Test Method 18, EPA Test Method 25 or 25A methane/non-methane hydrocarbon analyzer, ASTM D6348-12, EPA Test Method 320, or an alternative test method approved by the Control Officer. NO_x testing shall be conducted in accordance with EPA Test Method 7E. CO testing shall be conducted in accordance with EPA Test Method 10.

HF testing for the centralized wet scrubbers:

HF testing shall be conducted in accordance with EPA Test Methods 26, 26A, 320, ASTM D6348-12 or other test method as approved by the Control Officer.

Method 26A is the only viable method currently downstream of a wet scrubber, but the options were left in the permit in the event the Permittee needs to use them.

Rule 338 Capture testing requirements were added to permit, which Microchip plans to conduct performance testing to show 80% capture from the fans pulling to the RCTO. The testing will be conducted at the next 5 year removal efficiency performance test.

G. REGULATORY REQUIREMENTS AND MONITORING:

BACT- Rule 241

BACT is triggered by either of the following threshold limits set forth in Rule 241 §301:

301.1: Any new stationary source which emits more than 150 lbs/day or 25 tons/yr of volatile organic compounds, nitrogen oxides, sulfur dioxide, or particulate matter; more than 85 lbs/day or 15 tons/yr of PM10; or more than 550 lbs/day or 100 tons/yr of carbon monoxide.

301.2 Any modified stationary source if the modification causes an increase in emissions on any single day of more than 150 lbs/day or 25 tons/yr of volatile organic compounds, nitrogen oxides, sulfur dioxide or particulate matter; more than 85 lbs/day or 15 tons/yr of PM10; or more than 550 lbs/day or 100 tons/yr of carbon monoxide. BACT is only required for the sources or group of sources being modified.

Microchip exceeds the BACT threshold for VOCs. The Permittee has previously accepted a BACT during initial permit issuance for the RTO 20-1 to meet Rule 338 VOC control efficiencies:

Achieve at least 80% overall VOC-control of photoresist VOC, including capture and processing of photoresist VOC, as determined by applicable provisions in Rule 338 Section 503; or

Capture at least 90% of all photoresist VOC and achieve an hourly average stack concentration not exceeding 20 mg VOC/standard cubic meter, as determined by applicable provisions in Rule 338 Section 503. Mass loading of VOC is expressed as milligrams of non-methane organic carbon; or

Achieve an outlet concentration of 10 ppmv or less total VOCs measured as propane

During Permit Revisions 1.0.6.0 through 2.0.0.0 (all processed together) the facility accepted an increase in VOC removal efficiency of 81% and 91%, respectively. This increase was accepted due to a request by Microchip to allow 72 hours of bypass time per year to account for maintenance activities. This removal efficiency is considered VOC BACT for Microchip.

This renewal added additional language into the control section to account for the VOC abatement control efficiencies that are not photoresist operations. Microchip is estimating 80% control efficiency for all VOC semiconductor opreations; therefore the above condition was updated to the following:

Achieve at least 81% overall VOC control of **all semiconductor operation** VOCs, including capture and processing of all semiconductor operations VOCs, as determined by applicable provisions in Rule 338 Section 503; or

Capture at least 91% of **all semiconductor operation** VOCs and achieve an hourly average stack concentration not exceeding 20 mg VOC/standard cubic meter, as determined by applicable provisions in Rule 338 Section 503. Mass loading of VOC is expressed as milligrams of non-methane organic carbon; or

Achieve an outlet concentration of 10 ppmv or less total VOCs measured as propane.

Bolded for emphasis on what changed.

Daily emission limits were added for all other pollutants for which BACT was not triggered.

Maricopa County
Air Quality Department

NON-TITLE V
COMPLETENESS DETERMINATION CHECKLIST

Items 1-15 Front page: Items 1 to 15 (14 for Renewals) must be completed.

Notes to engineer:

- *For renewal applications the source must either answer 'No' to questions 2-5 or submit an application for a permit modification.*
- *Item 8: Many applicants do not know the SIC code or NAICS code for their industry. For a new application the code can be obtained by doing an on-line search. http://www.osha.gov/pls/imis/sicsearch.html*
- *Items 5, 7 and 14: These may be the same for many applicants.*

Complete: [xx] Incomplete: [ ]

Item 16: A simple site diagram has been included, preferably on a standard size paper. Detailed blueprints or construction drawings are not required.

Complete: [ ] Incomplete: [ ] N/A: [x]

Item 17: A simple process flow diagram on a standard size paper is preferred. A process flow diagram may not be needed for some small businesses.

Complete: [ ] Incomplete: [ ] N/A: [x]

Item 18: An O&M plan is required only for a control device. An O&M plan is not required for a spray booth. Instead of including the O&M plan with the application, an applicant may submit it after receiving the permit.

Complete: [x] Incomplete: [ ] N/A: [ ]

Item 19: A dust control plan, if required, must accompany the permit application. The plan will be reviewed and approved by the dust compliance group.

Complete: [ ] Incomplete: [ ] N/A: [x]

Item 20: The applicant needs to complete only those sections of the permit application that are applicable.

Complete: [ ] Incomplete: [ ] N/A: [x]

Notes to engineer:

- *Concerning Section Z: Many applicants will not be able to perform these engineering calculations. We will accept the permit application with a blank Section Z.*

Instructions for completing Sections A, B, C, D, E-1, E-2, F, G, H, I, J, K-1, K-2, K-3, K-4, L, M, X-1, X-2, Y and Z of the permit application are included at the beginning of each section and are self-explanatory.

In general, a material safety data sheet (MSDS) is required for each chemical used, stored or processed at the facility. Exceptions are for very common materials, such as gasoline, diesel, acetone, etc.

Business name: **Microchip**

Permit number: **000089**

Completeness review completed.
Application determined to be: Complete: [ ] Incomplete: [ ]

Permit Engineer: **Ralph Munoz** Date: **10/07/2015**